

**ADDENDUM NO. 1**  
**CITY OF COPPERAS COVE TRUCK WASH FACILITY**  
**COPPERAS COVE SOLID WASTE**

**February 24, 2020**

**Project Manual:**

Add the following specifications to the Project Manual:

Project Manual:

Section 03 31 10 CAST IN PLACE CONCRETE;

Section 08 71 00 FINISH HARDWARE

**End of Addendum**



## **SECTION 03 31 10 - CAST-IN-PLACE CONCRETE**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including Uniform General and Supplementary General Conditions and other Divisions 00 and 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes, but is not limited to, the following:
  - 1. This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.

#### **1.3 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 01 Specification Sections.
- B. Six copies of all product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, void forms (including PSF supporting weights), and others as requested by Architect.
- C. One set of reproducibles and three copies of shop drawings for reinforcement, for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures," showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement.
- D. Six copies of mix designs for each type of concrete.

#### **1.4 QUALITY ASSURANCE**

- A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:
  - 1. ACI 318, "Building Code Requirements for Reinforced Concrete."
  - 2. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
  - 3. ACI 301, "Specifications for Structural Concrete for Buildings."

## **PART 2 - PRODUCTS**

### **2.1 FORM MATERIALS**

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints.
  - 1. Use overlaid plywood complying with U.S. Product Standard PS-1, MDO grade, Class I.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Lumber dressed on at least two edges and one side for tight fit.
- C. Form Coatings: Provide commercial formulation form-coating compounds with a maximum VOC of 350 mg/l that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inch to exposed surface. Provide ties that, when removed, will leave holes not larger than 1-inch diameter in concrete surface.
- E. Fillets for Chamfers: Rigid plastic of maximum practicable lengths.

### **2.2 REINFORCING MATERIALS**

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed, of domestic manufacture.
  - 1. Bars shall be bent cold in accordance with ACI 318. Heating or bending by makeshift methods are not permitted.
  - 2. Bars having kinks or bends not shown on shop drawings shall not be used.
- B. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- C. Welded Wire Fabric: ASTM A 185, Grade 65, welded steel wire fabric, flat sheets.
- D. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications.
  - 1. For slabs-on-grade or void form, use supports with sand plates or horizontal runners (void forms only) where base material will not support chair legs.

### **2.3 CONCRETE MATERIALS**

- A. Portland Cement: ASTM C 150, Type I.
- B. Fly Ash: ASTM C 618, Type C or Type F.
- C. Normal Weight Aggregates: ASTM C 33 and as herein specified. Provide aggregates from a single source for exposed concrete.
  - 1. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.

2. Fine Aggregate: Natural sand.
  3. Coarse Aggregate: Gravel or crushed stone. Pit run material is not acceptable. The nominal maximum size of the aggregate shall not be larger than one-fifth (1/5) the narrowest dimensions between sides of forms, one-third (1/3) the depth of slabs, nor three-fourths (3/4) of the minimum clear distance between reinforcing bars or between bars and forms, whichever is least. In columns, the nominal maximum size of the aggregate shall be limited as above but shall not be larger than two-thirds (2/3) of the minimum clear distance between bars.
- D. Water: Drinkable.
- E. Admixtures, General: Provide admixtures for concrete that contain not more than 0.1 percent chloride ions.
- F. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures, equal to Master Builders "Micro Air" or "MB-VR."
- G. Water-Reducing Admixture: ASTM C 494, Type A, equal to Master Builders "Pozzolite N" or "Polyheed."
- H. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E, equal to Master Builders "Pozzutek 20."
- I. Water-Reducing, Retarding Admixture: ASTM C 494, Type D, equal to Master Builders "Pozzolite R."
- J. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C494, Type F or G, equal to Master Builders "Rheobuild" or "Polyheed".

## **2.4 RELATED MATERIALS**

- A. Slab Joint Forms: 24 gauge screed key joints.
1. Products: Subject to compliance with requirements, products that may be incorporated include, but are not limited to:
    - a. Burke Concrete Accessories, Inc.
    - b. Superior Concrete Accessories, Inc.
- B. Void Forms: Corrugated fiberboard laminated with waterproof adhesive and coated with water-resistant compound.
1. Forms shall be of square design; trapezoidal shape not approved.
  2. Provide pre-manufactured curve-ended units, "ArcVoid" or "SureRound PierVoid", against tops of drilled piers for tight fit. Cartons shall be capable of sustaining a working load of 150 PSF times the height of pour, in feet, without significant deformation.
  3. Topping Sheets: 275 # PSJ sheets as manufactured by Voidco, Inc.
- C. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper.
  2. Polyethylene film.
  3. Polyethylene-coated burlap.
- D. Curing and Hardener Compound:
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. "1100-Clear Series", W.R. Meadows, Inc. (building slab).
    - b. "1600-White Series," W.R. Meadows, Inc. (site paving).
- E. Underlayment Compound: Free-flowing, self-leveling, pumpable, cement-based compound for applications from one inch thick to feathered edges.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
    - a. "K-15," Ardex, Inc.
    - b. "Thoro Underlayment Self-Leveling," Thoro System Products.
- F. Soil Retainers: High-density polyethelene, flexible retainers to prevent migration of backfill under suspended building foundation. Retainer shall extend above and below void form depth as required by manufacturer, have sufficient strength to resist lateral loads applied by soil, and be impact resistant. Retainer shall be capable of being exposed to earth and moisture without deterioration. Approved product, SureRetainer by Motzblock; VoidForm Products, Inc., (888) 803-8643.
- G. Floor Sealer: Equal to "Liqui-Hard" floor hardener, as manufactured by W.R. Meadows, Inc.
- H. Dovetail Slot: Equal to Hohmann & Barnard, Inc. #305, minimum 22 gauge, hot-dip galvanized.
- I. Vapor Barrier: 31 mil polyvinyl composite vapor retarder, VBC-350 manufactured by Barrier-Bac, Inc.

## **2.5 PROPORTIONING AND DESIGN OF MIXES**

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs.
1. Limit use of fly ash to not exceed 25% of cement by weight.

- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed by Architect.
- C. Design mixes to provide normal weight concrete with the following properties:
  - 1. Grade Beams/Walls and Slabs on Void Forms: 4,000 psi, 28-day compressive strength.
  - 2. Piers, Concrete Flatwork and Sidewalks, and Miscellaneous Concrete: 3,000 psi, 28- day compressive strength
  - 3. Concrete Site Pavement: 3,500 psi, 28-day compressive strength.
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

## **2.6 ADMIXTURES**

- A. Use water-reducing admixture or high-range water-reducing admixture (super plasticizer) as required for placement and workability.
- B. Use nonchloride accelerating admixture in concrete slabs placed at ambient temperatures below 50°F.
- C. Use air-entraining admixture in exposed normal weight concrete (concrete site improvements). Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content by volume with a tolerance of plus or minus 1-1/2 percent within following limits:
  - 1. 4.5 to 5.5 percent, 1-1/2-inch max. aggregate.
  - 2. 4.5 to 6.0 percent, 1-inch max. aggregate.
  - 3. 5 to 6 percent, 3/4-inch max. aggregate.
  - 4. 5.5 to 7.0 percent, 1/2-inch max. aggregate.
- D. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.
- E. Calcium chloride shall not be used.

- F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement, as follows:

| PLACEMENT APPLICATION | SLUMP RANGE (IN ) | AIR CONTENT RANGE (%) | CONCRETE TEMPERATURE RANGE | AMBIENT TEMPERATURE RANGE | MAXIMUM AIR HUMIDITY (%) |
|-----------------------|-------------------|-----------------------|----------------------------|---------------------------|--------------------------|
| Piers, dry            | 5-6               | not applicable        | 50-100                     | 40-100                    | not applicable           |
| Piers, cased          | 6-8               | not applicable        | 50-100                     | 40-100                    | not applicable           |
| Footings              | 4-5               | not applicable        | 50-100                     | 40-100                    | not applicable           |
| Pier caps             | 4-5               | not applicable        | 50-100                     | 40-100                    | not applicable           |
| Columns               | 4-6               | not applicable        | 50-100                     | 40-100                    | not applicable           |
| Grade beams           | 4-5               | not applicable        | 50-100                     | 40-100                    | not applicable           |
| Walls                 | 4-5               | not applicable        | 50-100                     | 40-100                    | not applicable           |
| Slab-on-void forms    | 4-5               | not applicable        | 50-100                     | 40-90                     | 40 or above              |
| Drainage structures   | 3-5               | 3-6                   | 50-100                     | 40-100                    | not applicable           |
| Paving / walks        | 3-5               | 3-6                   | 50-100                     | 40-89                     | 40 or above              |
| Paving / walks        | 3-4.5 **          | 3-6                   | 50-100                     | 90-95 **                  | 30 or above              |
| Paving / walks        | 3-4               | 3-6                   | 50-100                     | 96-100                    | not applicable           |

\*\* This specification also requires placement to begin by 10:00 AM and completed by Noon.

ALL SPECIFIED RANGES ARE MINIMUM-TO-MAXIMUM.

## 2.7 CONCRETE MIXING

- A. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.
- B. Ready-Mix Concrete: Comply with requirements of ASTM C 94, working under Alternate No. 2.
  1. When air temperature is between 85°F. and 90°F., reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F., reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Coordinate the installation of joint materials and other related materials with placement of forms and reinforcing steel.

### 3.2 FORMS

- A. General: Design, erect, support, brace, and maintain formwork to support vertical and lateral, static and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACI 347.

- B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
- C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
- D. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- E. Chamfer exposed corners and edges as indicated, using chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retighten forms and bracing before concrete placement as required to prevent mortar leaks and maintain proper alignment.
- H. Form full height of both sides of grade beams. Ground-forming not acceptable.

### **3.4 PLACING REINFORCEMENT**

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect.
- D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- F. In slabs on grade, place conduit, pipe, etc. under reinforcement.
- G. Do not place concrete until steel placement has been reviewed by Architect.



- H. Employ competent mechanics to maintain reinforcement location while placing concrete.

### **3.5 CONSTRUCTION OR COLD JOINTS**

- A. Locate and install so as not to impair strength and appearance of the structure, and as directed by Architect.
- B. Joints shall be located at the third point of the span of slabs and beams (unless a beam intersects another beam at this point, in which case the joint shall be offset a distance equal to twice the width of the beam).

### **3.6 INSTALLATION OF EMBEDDED ITEMS**

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.
- B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to obtain required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

### **3.7 PREPARATION OF FORMED SURFACES**

- A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before reinforcement is placed.
- B. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- C. Coat steel forms with a nonstaining, rust-preventative material; rust-stained steel formwork is not acceptable.

### **3.8 CONCRETE PLACEMENT**

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work.
- B. General: Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
- C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete to avoid segregation at its final location.
- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
  - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
  - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at

least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

- E. **Placing Concrete Slabs:** Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
  - 1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Bring slab surfaces to correct level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
  - 3. Maintain reinforcing in proper position during concrete placement.
- F. **Cold-Weather Placing:** Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- G. Do not place concrete when air temperature has fallen to or is expected to fall below 40°F., during placement or is predicted to be below 32°F. within 24 hours following placement.
  - 1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  - 2. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- H. **Hot-Weather Placing:** When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
  - 1. Do not place concrete if temperature is above 100°F.
  - 2. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90°F. Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
  - 3. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
  - 4. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
  - 5. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, when acceptable to Architect.

### **3.9 FINISH OF FORMED SURFACES**

- A. **Rough Form Finish:** For formed concrete surfaces not exposed to view in the finish work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.
- B.

- C. Smooth Rubbed Finish: For formed concrete surfaces exposed to view in the finish work. Provide smooth rubbed finish immediately after form removal.
  - 1. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

### **3.11 MONOLITHIC SLAB FINISHES**

- D. Nonslip Broom Finish: Apply nonslip broom finish to floor slab. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

### **3.12 CONCRETE CURING AND PROTECTION**

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but before power floating and troweling.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
- C. Curing Methods: Perform curing of concrete by curing and sealing compound, or by moist curing, as herein specified.
- D. Provide moisture curing by following methods.
  - 1. Keep concrete surface continuously wet by covering with water.
  - 2. Use continuous water-fog spray.
  - 3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
- E. Provide curing and sealing compound to exposed concrete as follows:
  - 1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
  - 2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.
- F. Final cure concrete surfaces to receive finish flooring by use of moisture-retaining cover,

unless otherwise directed.

### **3.13 REMOVAL OF FORMS**

- A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50°F. for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days and until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

### **3.14 REUSE OF FORMS**

- A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces.

### **3.15 MISCELLANEOUS CONCRETE ITEMS**

- A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
- C. Floor Sealer: Apply approved sealer to all exposed concrete floor surface not scheduled to receive finished floor materials after floor has cured a minimum of 28 days and it has been mechanically cleaned of any curing compounds. Apply materials in coverages and in accordance with manufacturer's requirements.
- D. Vapor Barrier: Install vapor barrier with "fuzzy" side up in accordance with manufacturer's instructions. Overlap joints at least 6 inches and seal with manufacturer's tape. Seal all penetrations per manufacturer's instructions. Repair damaged areas by applying patches of vapor retarder, overlapping at least 6 inches, and taping all sides.

### **3.16 CONCRETE SURFACE REPAIRS**

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.
  - 1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified

bonding agent. Place patching mortar before bonding compound has dried.

2. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- B. Repair isolated random cracks and single holes not over 1 inch in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry-pack before bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.
- C. Perform structural repairs with prior approval of Architect for methods using approved epoxy adhesive and mortar.

### **3.17 QUALITY CONTROL TESTING DURING CONSTRUCTION**

- A. General: The Owner will employ a testing laboratory to perform tests and to submit test reports.
- B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.
- C. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
  1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
  2. Air Content: ASTM C 173, volumetric method or ASTM C 231, pressure method; one for each day's pour of each type of air-entrained concrete.
  3. Concrete Temperature: ASTM C1064, one test hourly when air temperature is 40°F. and below, when 80°F. and above, and each time a set of compression test specimens is made.
  4. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.
  5. Compressive Strength Tests: ASTM C 39; one set for each 75 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
- D. Test results will be reported in writing to the Owner, Architect, Structural Engineer, Ready-Mix Producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
- E. Evaluation of Test Results:
  1. Each strength test result shall be the average of 2 cylinders from the same sample tested at 28 days.

2. The strength level of the concrete will be considered satisfactory if the averages of all sets of three consecutive strength test results equal or exceed the specified strength and no individual test result falls below the specified strength by more than 500 psi.
  3. Test results will be reported in writing to Architect, Structural Engineer, Ready-Mix Producer, and Contractor within 24 hours if tests fail to achieve specified requirements.
- F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

- END OF SECTION 03 31 10 -

## **SECTION 08 71 00- FINISH HARDWARE (ALTERNATES NO. 1 & 2)**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

#### **1.2 DESCRIPTION OF WORK**

- A. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.
- B. Extent of finish hardware required is indicated on drawings and in schedules.
- C. Types of finish hardware required include the following:
  - 1. Hinges
  - 2. Continuous hinges
  - 3. Lock cylinders and keys
  - 4. Lock and latch sets
  - 5. Bolts
  - 6. Push/pull sets
  - 7. Closers
  - 8. Overhead stops
  - 9. Miscellaneous door control devices
  - 10. Door trim units
  - 11. Protection plates
  - 12. Weatherstripping for exterior doors
- D. Silencers included integral with hollow metal frames specified with door frames elsewhere in Division 8.

#### **1.3 QUALITY ASSURANCE**

- A. Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, and closers) from a single manufacturer, although several may be indicated as offering products complying with requirements.

- B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced Architectural Hardware Consultant (AHC) in good standing as certified by the Door and Hardware Institute, who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor.
- C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements. Provide only hardware which has been tested and listed by UL or FM for types and sizes of doors required and complies with requirements of door and door frame labels.

#### **1.4 SUBMITTALS**

- A. Product Data: Submit manufacturers technical product data for each item of hardware in accordance with Section 01300 - Submittals. Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finishes.
- B. Hardware Schedule: Submit five final hardware schedules in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.
  - 1. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
    - a. Type, style, function, size and finish of each hardware item.
    - b. Name and manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of hardware set cross-referenced to indications on drawings both on floor plans and in door and frame schedule.
    - e. Explanation of all abbreviations, symbols, codes, and acronyms contained in schedule.
    - f. Door and frame sizes and materials.
  - 2. Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.
  - 3. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.



- C. Samples: At Architects request and prior to final ordering of finish hardware, submit one sample of each type of exposed hardware unit requested, finished as required, and tagged with full description for coordination with schedule.
  - 1. Samples will be returned to the supplier. Units which are acceptable and remain undamaged through submittal, review and field comparison procedures may, after final check of operation, be used in the work, within limitations of keying coordination requirements.
- D. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

## **1.5 PRODUCT HANDLING**

- A. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packaged in same container.
- C. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.
- E. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

## **1.6 WARRANTY**

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Submit a copy of the warranty with the hardware schedule.
  - 1. Warranty Period: Three years from date of substantial completion, except as follows:
    - a. Exit Devices: Two years from date of substantial completion.
    - b. Manual Closers: 10 years from date of substantial completion. A copy of the warranty shall be furnished with the hardware schedule.

## **PART 2 - PRODUCTS**

### **2.1 SCHEDULED HARDWARE**

- A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the

end of this section. Items listed are taken from the following manufacturer's catalogs and represent specification standards.

1. Hinges: Hager Hinge Co., St. Louis, Missouri. (H)
  2. Cylinders: Schlage (S).
  3. Locks and Latches: Corbin Russwin (R).
  4. Exit Devices, Removable Mullions: Von Duprin (VD). (No substitutions.)
  5. Extruded Thresholds: Pemco, Ventura, California, (P) National Guard Products, Inc., Memphis, Tennessee. (NG)
  6. Closers: Norton (N) or LCN (L).
  7. Cast Thresholds: Wooster Products, Inc., Wooster Ohio. (W)
  8. Weatherstripping: Pemko, Ventura, California (P); National Guard Products, Inc., Memphis, Tennessee (NG).
  9. Miscellaneous Hardware: H.B. Ives, New Haven, Connecticut (I), Trimco Manufacturing, Los Angeles, California (T), Stanley Works (S), Forms & Surfaces (F&S), or Rockwood (R).
  10. Security Hardware: Locknetics.
- B. ANSI/BHMA designations used elsewhere in this section or in schedules to describe hardware items or to define quality or function are derived from the following standards. Provide products complying with these standards and requirements specified elsewhere in this section.
1. Butts and Hinges: ANSI A156.1 (BHMA 101)
  2. Locks and Lock Trim: ANSI A156.2 (BHMA 601)
  3. Exit Devices: ANSI A156.3 (BHMA 701)
  4. Door Controls: Closers: ANSI A156.4 (BHMA 301)
  5. Auxiliary Locks: ANSI A156.5 (BHMA 501)
  6. Architectural Door Trim: ANSI A156.6 (BHMA 1001)
  7. Template Hinge Dimensions: ANSI A156.7
  8. Door Controls - Overhead Holders: ANSI A156.8 (BHMA 311)
  9. Mortise Locks & Latches: ANSI A156.13 (BHMA 621)

## **2.2 MATERIALS AND FABRICATION**

- A. General:

1. Hand of Door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
2. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
3. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
4. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
5. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.
6. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

## **2.3 HINGES**

- A. Templates Hinges: Provide only template hinges which conform to ANSI whenever applicable.
- B. Use ball bearing hinges on heavy doors, doors where high frequency service is expected and doors equipped with door closers.
- C. All hinges to be used on exterior doors shall be of non-ferrous material, brass, bronze or stainless steel.
- D. Hinge Pins, Except as Otherwise Indicated, Shall be as Follows:
  1. Steel Hinges: Steel pins.
  2. Non-ferrous Hinges: Stainless steel pins.
  3. Exterior Doors: Non-removable pins (NRP) or security stud.
  4. Interior Doors: Non-rising pins.
  5. Tips: Flat button and matching plug, finished to match leaves.

E. Size of Hinges Shall be as Follows:

| Door thickness and width | Hinge Height | Hinge Width       |
|--------------------------|--------------|-------------------|
| 1-3/4 to 36"             | 4-1/2        | 4-1/2             |
| 1-3/4 over 36"           | 5            | 4-1/2 Extra Heavy |

F. Number of Hinges per Door - Provide Quantities as Follows -

For doors less than 5 feet high - 1 pair.

For doors 5 feet to 7 feet 6 inches high - 1-1/2 pair and one additional hinge for each additional 2-1/2 feet or fraction thereof.

G. Where projection of door trim is such as to prevent desired degree of opening, the proper hinge width shall be provided to allow the door to clear the trim.

H. Acceptable Manufacturers:

1. Bommer Industries, Inc.
2. Hager Companies
3. McKinney Products Co.
4. Stanley Commercial Hardware
5. Roton or Select (continuous hinges).

## 2.4 KEYING

A. Furnish the Following Keys -

1. Three (3) conventional masterkeys.
2. Two (2) keys per lockset.

B. All keying shall be as directed by the Owner before the finish hardware schedules are submitted for approval. A keying meeting shall be attended by the hardware supplier prior to submittal of hardware schedule.

C. ALL EXTERIOR DOORS SHALL BE PROVIDED WITH INTERCHANGEABLE (IC) CORES.

E. Acceptable manufacturers shall include Schlage.

## 2.5 LOCKS

A. Mortise Locks:

1. Locks shall have all functions available in one size case, manufactured from heavy gauge steel, minimum thickness 3/32", completely chrome plated for corrosion resistance and lubricity of parts. Cases are to be closed on all sides to protect internal parts. Locks are to have adjustable, beveled and armored fronts, standard 2-3/4" backset, convertible from

one function to another, a full 3/4" throw anti-friction latch bolt, a 1" throw dead bolt with hardened steel insert and available for a minimum door thickness of 1-3/8". Internal parts shall be heavy gauge steel, zinc dichromate plated and nickel steel hubs.

2. All locksets with latch bolts, regardless of trim, shall be listed by Underwriters Laboratories for A and lesser labeled doors, single or pairs.
3. Locksets to be used on specified exterior doors shall be of non-ferrous parts and case, brass, bronze or stainless steel.
4. Lock trim, knob, sectional or escutcheon type, shall be thru bolted through the lock case to assure correct alignment and proper operation.
5. Lock trim shall be solid brass levers, lever attachment to be screwless, rose minimum diameter to be 2-7/8".
6. Locksets shall conform to Federal Specifications type 86 and 87 and be certified as meeting ANSI A156.2 Grade 1 requirements.
7. Acceptable Manufacturers:
  - a. Schlage "L" Series.

B. Heavy Duty Cylindrical Locks:

1. Heavy duty cylindrical locks shall have a steel chassis, zinc and dichromate plated for rust resistance, which fits a 2-1/8" hole in the door. The latch bolt shall have a minimum throw of 1/2". The regular backset to be 2-3/4" minimum with greater backsets available where scheduled. Levers shall be solid brass with no riveted plastic inserts. The outside lever to be removable for rekeying without the removal of the lockset from the door or by using a key. Rose liners shall be furnished which lock the chassis into the door cutout, helping to prevent lock movement and loosening. Cylinders shall be conventional, high security and removable core types.
2. Locksets shall conform to Federal Specification FF-H- 00106B, type 161, be certified as meeting ANSI A156.2 Grade 2 requirements and be listed by Underwriters Laboratories for all classes of labeled doors.
3. Acceptable Manufacturers:
  - a. Schlage "AL" Series.

## 2.6 CLOSERS

- A. Closers shall be rack and pinion construction with both rack and pinion of heat treated steel and with a cast hydraulic iron or aluminum case. They shall be non-sized with adjustable spring power to accommodate sizes 1 thru 6. Closing the door shall be controlled by two valves, one to control closing speed and one to control latching speed. Closers shall be regularly furnished with fully adjustable backcheck and a backcheck selector valve allowing approximate 70° backcheck on both regular and parallel arm closers. Delayed action shall be available. Valves shall be concealed against unauthorized adjustment and be non-critical needle valve type. Closer arm joints shall be permanently affixed or affixed with tamper proof screws; snap-apart arms are not acceptable. EXTERIOR CLOSERS SHALL HAVE EXTRA-DUTY ARMS. Closers shall be surface applied using sex nuts and bolts, with rectangular covers void of manufacturer's trademarks, projection not over 2-3/4" and capable of being applied on 1-3/4" top rail or top jamb for inverted mounting. When required, covers shall be available in bronze and chrome finishes.

- B. Closer shall be certified as meeting the ANSI A156.4 Grade 1 requirements be listed by Underwriters Laboratories (UL) for all classes of labeled doors.
- C. Acceptable Manufacturers (Provide closers from one manufacturer). In schedule, prefix "P" denotes parallel arm:
  - 1. Exterior:
    - a. LCN 4040 EDA
    - b. Norton PR 7500
  - 2. Interior:
    - a. LCN 1461
    - b. Norton 8501

## **2.7 OVERHEAD HOLDERS AND STOPS**

- A. Rixson- Firemark.

## **2.8 EXIT DEVICES**

- A. Von Duprin (NO SUBSTITUTIONS).

## **2.9 SILENCERS**

- A. Door silencers shall be manufactured from a good grade of rubber with a head 1/2" in diameter, to be applied to the jamb stop strip, have 1/8" uncompressed projection, accommodate metal thickness of 3/32" in a hole 9/32" in diameter. Projection inside of frame to be a minimum of 11/32". Provide three (3) silencers per strike jamb for single doors and two (2) for pairs of doors at the head. Furnish installation tool for Owner's use.

## **2.10 WEATHERSTRIPPING**

- A. Pemko.
- B. National Guard Products, Inc.

## **2.11 THRESHOLDS**

- A. Pemko, National Guard Products, Inc. and Wooster Products, Inc.

## **2.12 PUSH PLATES, PULLS, FLOOR STOPS, AND WALL STOPS**

- A. Trimco, Quality, Forms & Surfaces, Rockwood, Stanley, or H.B. Ives. Unless otherwise scheduled, all doors not equipped with holding or staying devices shall be supplied with a stop, which shall control the limit of opening to prevent damage to walls and other finish materials/equipment, or to the door and its hardware.

## **2.13 HARDWARE FINISHES**

- A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color and texture.
- B. Provide finishes which match those established by BHMA or, if none established, match the Architect's sample.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.
- C. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer".
- D. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI A156.18 "Materials & Finishes Standard", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.
- E. Finish of items shall be as follows:
  - 1. Hinges: US26D, US32D.
  - 2. Locksets: US26D.
  - 3. Exit Devices: US26D.
  - 4. Door Closers: Silver aluminum lacquer finish (cover and arm).
  - 5. Door Holders/Stops: US26D and silver aluminum lacquer.
  - 6. Push, Pull, Kick, Mop and Armor Plates: US26D, US32D.
  - 7. Flush Bolts, Stops: US26D.
  - 8. Miscellaneous Items: US26D.
- F. The finish of items not specifically mentioned above or set forth in the schedule shall be US26D unless shown otherwise.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Refer to the following mounting heights, otherwise, mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames by the Door and Hardware Institute" (DHI), or to comply with requirements of governing regulations, requirements for accessibility, or as otherwise directed by the Architect.
  - 1. Center Line of Door Knobs: 38".
  - 2. Center Line of Door Pulls: 38" to center line.

3. Center Line of Push Plates: 38" to center line.
  4. Center Line of Exit Devices:  $\pm 39\frac{1}{2}$ " to suit manufacturers standard.
  5. Center Line of Dead Locks:  $\pm 48$ ", coordinate with push and pull plates, or as otherwise directed.
  6. Upper Edge of Top Hinge:  $\pm 5$ " to suit manufacturers standard below head or frame.
  7. Bottom Edges of Bottom Hinge:  $\pm 10$ " to suit manufacturers standard above floor.
  8. Center hinge(s) spaced equal between top and bottom hinge.
- B. DEGREE OF OPENING FOR DOORS WITH OVERHEAD HOLDERS AND CLOSERS AND SIDE OF DOOR WHICH DEVICE IS TO BE MOUNTED SHALL BE INCLUDED IN THE HARDWARE SCHEDULE FOR THE ARCHITECT'S APPROVAL.
- C. **ALL HARDWARE SHALL BE INSTALLED BY TRADESMEN SKILLED IN THE APPLICATION OF COMMERCIAL GRADE HARDWARE FOR AT LEAST 10 YEARS. (THIS MEANS A TRADESMEN WHOSE PRIMARY OCCUPATION IS THE INSTALLATION OF HARDWARE).**
- D. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Securely fasten all parts to be attached. Fit faces of mortised parts snug and flush. Make sure all operating parts move freely and smoothly without binding, sticking or excessive clearance. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, the hardware shall be removed and stored prior to the painting or finishing. Items shall then be reinstalled only when the finishes have been completed on the surface to which the hardware is to be applied.
- E. At exterior doors and elsewhere as indicated, set thresholds in a bed for sealant to completely fill concealed voids and exclude moisture from every source. Do not plug drain holes or block weeps. Remove excess sealant.
- F. Install door closers so that arms are not visible on the public side of the door. Closers shall be installed to allow for 180° swing.
- G. After installation, representative templates, instruction sheets and installation details shall be placed in a file folder to be turned over to the Owner when the building is accepted. Included shall be at least five each of any special adjusting and/or installation tools furnished with the hardware by the manufacturers.

### **3.2 ADJUST AND CLEAN**

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.



- D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.
- E. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

### **3.3 PROTECTION**

- A. Whenever hardware is located in areas where it may be subject to damage during construction by handling, cleaning, or other construction activities, (i.e., painting, cleaning of bricks) it shall be protected and/or removed from its location until the hazardous condition is terminated.

### **3.4 SCHEDULE**

- A. REFER TO DRAWINGS

- END OF SECTION 08 71 00 -